Hypothesis Concerning Cause of Ground-to-Cloud Movement of X-Ray Energy Source in Cloud-to-Ground Lightning Strikes

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Introduction

Although it is understood that lightning strikes lead to the production of X-Rays, the specific movement of the point source of these X-Rays continues to baffle researchers. In a cloud-to-ground lightning strike, for instance, X-Ray detectors have enabled the discovery that X-Rays are first generated at ground level with the point source of X-Rays moving upward, doubling back through the path through which electrons flowed to arrive at the ground. No plausible explanation for this counterintuitive phenomenon has heretofore been proposed.

Abstract

The aforementioned behavior may be explained by a combination of two factors that are present in the moments after a lightning bolt makes initial contact with the ground.

The first of these is that plasma (i.e. a mixture of ions and free electrons) are generated by the passage of the surge of electrons through the pathway of the lightning bolt. Many of these liberated electrons, through a fluke of physics, are able to remain stationary (despite many of them are converted into light and are scattered) for a sufficient length of time for the positively charged element of that plasma to act as a conductor for electrons which have inverted in direction.

Although this directional inversion of electrons has already been identified, the underlying cause of this inversion has not been. The possibility of liberated electrons remaining roughly stationary during the relevant time window is what enables this inversion.

Electrons on the leading edge of the lightning strike liberate an initial quantity of electrons which, although stationary (i.e. they have low energy,) are sufficiently concentrated that subsequent electrons in isolation are overpowered by clusters of the stationary electrons. Stationary electrons outnumber high-energy electrons during the early stages of discharge, but not during the later stage.

These clusters of low-energy "stationary" electrons have sufficient electroweak (Coulomb) force to bring about inversions of angular momentum (i.e. reflections) of electrons during the latter portion of the window of discharge. In this unique circumstance, rather than the electrons being converted into photons, the electrons moving toward the ground are inverted in a "gentle" fashion, enabling them to retain most of their mass, unlike photons, which are simply electrons

stripped of most of their mass through the discrete magnetic moment surge associated with the angular-to-spin momentum conversion process (ibid.)

As these inverted electrons move backward through their previous path, they are conducted by ions but interact with *both* stationary electrons and relativistic electrons as they move upward. Interaction between full-mass electrons with combined velocities exceeding C result in the production of X-Rays.

Conclusion

This more complete understanding of X-Ray genesis in lightning fits well with other hypotheses from this author and should serve to enable further advancements.